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Development of local area network (LAN) at SMK 1 belitang madang raya

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A B S T R A C T

The Internet is a global network of world computers, large and very broad where every computer is connected to each other from country to country around the world and contains various kinds of information [1]. The internet itself comes from the word interconnection networking which means the connection of many computer networks of various types and types, using communication types such as telephone, satellite, and others. In managing computer network integration using TCP or IP protocols. Local Area Network (LAN) consists of several computers connected in a network. In this network, each computer can access data from other computers. computers that are connected in a LAN can run hardware such as other computer printers, send data to other computer owners or play games together. The number of computers connected to the LAN is relatively small, such as home computers, internet cafes, schools and several other computers that are in one building. In this study, the researcher used a quantitative method approach to analyze the use of information and communication technology in the construction of a LAN network in the SMK Negeri 1 BMR school.

I. Introduction

The Internet is a global network of world computers, large and very broad where every computer is connected to each other from country to country around the world and contains various kinds of information [1]. The internet itself comes from the word interconnection networking which means the connection of many computer networks of various types and types, using communication types such as telephone, satellite, and others. In managing computer network integration using TCP or IP protocols. TCP (Transmission Control Protocol) is in charge of ensuring that all connections work properly while IP (Internet Protocol) is for transmitting data from one computer to another. With the development of network technology, one of the technological advances in the field of transmission at this time is the use of Local Area Network (LAN) devices. Local Area Network devices allow for the relationship of information users so as to provide convenience in carrying out their activities. One example of implementing a Local Area Network is in a company or other agency.

Local Area Network (LAN) consists of several computers connected in a network. In this network, each computer can access data from other computers. computers that are connected in a LAN can run hardware such as other computer printers, send data to other computer owners or play games together. The number of computers connected to the LAN is relatively small, such as home computers, internet cafes, schools and several other computers that are in one building. The rapid development of information technology, especially the internet, allows the development of better information services in an educational institution or school. At the educational level, the implications of IT have also begun to use the internet as a facility for activities.

As the birthplace of technology, it is only natural that the world of education also uses technology to facilitate the implementation of learning. Educational technology is a systematic method for planning, using, and assessing all teaching and learning activities by paying attention to both technical and human resources and the interactions between them, so as to obtain a more effective form of education.

Not only in urban areas, in rural areas has also been entered by the development of information technology ranging from internet infrastructure provided by the government so that people can take advantage of technology. Including in the nation's village, Belitang Madang Raya sub-district, East Oku, technology has penetrated into all fields, such as in the field of education, especially in SMK Negeri 1BMR.

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SMK Negeri 1 BMR is quite good in application and there is a computer lab, consisting of 2 main computers, 40 computers according to the specifications in the computer laboratory, there is a switchhub, straight type LAN cable, server and wifi as well as on the internet network at SMK Negeri 1 BMR . For this reason, the author is interested in analyzing the existing network in the SMK Negeri 1 BMR school. In this study, researchers used a quantitative method approach to analyze the use of information and communication technology in the construction of a LAN network at SMK Negeri 1 BMR. The use of a descriptive approach with the aim of describing the object of research or research results, a method that serves to define or provide an overview of the object under study through data or samples that have been collected as is without analyzing and making generally accepted conclusions.

The internet network at SMK Negeri 1 BMR is quite good, it's just that when it is used in large quantities it makes the network less stable so that it makes the use of the internet connection disrupted, because the school is in a small village which is already difficult to access the internet, this is also become a problem for every student / student who is in SMK Negeri 1 BMR because of an unstable internet connection and inadequate tools such as broken cables and outdated laptops / PCs that can no longer be used, resulting in students / students at state high school 1 bmr when the learning process is not conducive.

Packet tracer is a network simulation software. Before performing the actual network configuration (activating the function of each "device hardware"). This simulation is very useful when creating a complex network that has only a limited number of physical components. The understanding and benefits of Cisco packet tracers are generally used by network experts before deploying a network in a company. The main purpose of a packet tracer is to provide a tool for students/students, teachers/lecturers, or practitioners to understand the principles of computer networks and the definition of Cisco packet tracer.

II. Method

2.1. Data Collection Method

The research methods that I use are 3 methods, namely the type of research and research methods.

Observation Method

This method of observation (observation) was carried out by reviewing and the author immediately went into the field to obtain and collect the data needed, observations were made on:

Place: SMK N 1 BMR

Time : September 01 To December 01 2021

Direct observation activities at SMK Negeri 1 carried out activities that analyzed the design of the LAN system for users of the Hostpot network at SMKN 1 BMR in order to increase the security of the computer network. At that time the author tried to get the data information needed for the design of the LAN system on the hotspot network at Smk Negeri 1 bmr. (Attachment 1: Research Certificate).

Interview

Interviews were conducted by conducting questions and answers with related parties. In the interview there was a new interview instrument, namely a description of the research presented in the form of a list of questions. The interview was conducted by conducting a Q&A with related parties, with the principal of the state smk 1 bmr to test the design of the local area network that was made. The interview was conducted at SMK Negeri 1 BMR on September 1, 2021. To obtain data related to the design. From interviews conducted, it can be seen how the flow in the design.

Literature review

At this stage, what is done is studying and researching how reading sources have a relationship with the problems encountered that can be used as a basis in this research such as study support books, journals, theses and notes as well as references to previous research.

2.2. System development method

The method of developing the local area network network configuration used is as follows:

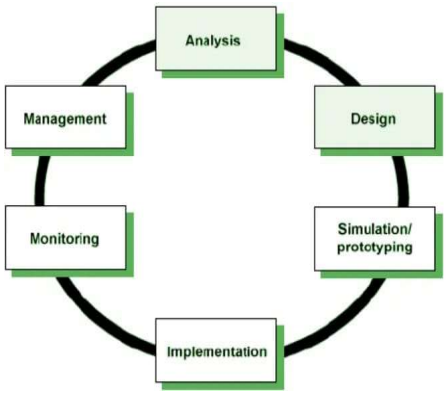

Figure 1. System development method

1. Analysis stage. The first step in analyzing is user needs analysis, device requirements analysis, network requirements analysis, feasibility analysis, network topology analysis.
2. Design stage, this stage from the data obtained previously, this design stage the author will design a network topology drawing to be built, data access design and so on.
3. Prototype Simulation Stage, This stage develops a network that will be made in the form of a simulation with the help of GNS3 tools. This is intended to see the

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performance of the network that will be built and become material for presentation and sharing with network system development.

4. Implementation stage, this stage will take a little longer. In carrying out the implementation, the author has implemented everything that was planned and designed previously. At this stage it will be seen how the development that will be built will have an influence on the existing system.
5. Monitoring stage, this stage has been implemented. The monitoring stage is an important stage so that the network and communication can run according to the wishes and objectives of the author in the early stages of the analysis.

Management stage. At this stage, one of the things that gets special attention is policy issues, namely in terms of activities, maintenance and management, they are categorized at this stage. Policies need to be made to create and regulate so that the system that has been built and runs well can last a long time and the element of reliability is maintained.

III. Results and Discussion

3.1. Overview of the current system

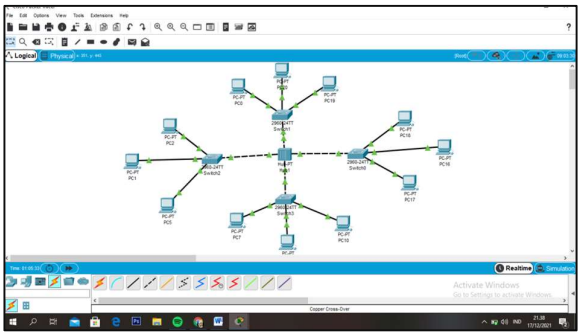

Figure 2. Running system

In Figure 2 is a picture of a system that is running using the Cisco packet tracer application and using a star network topology such as a star and the advantages of a star topology having a better security level.

3.2. The proposed system

Based on the system Figure 3 above, it is explained:

1. Use 32pc, 6pcs switches

2.Using straight type UTP cable with RJ45. connector

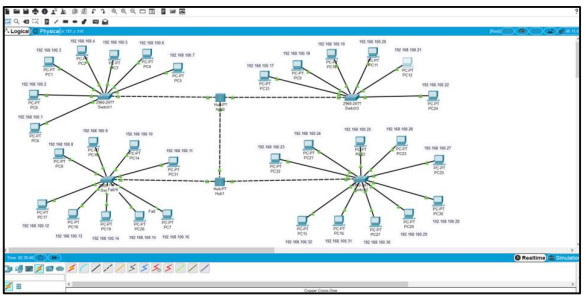

Figure 3. The proposed system

3.3. Server Test

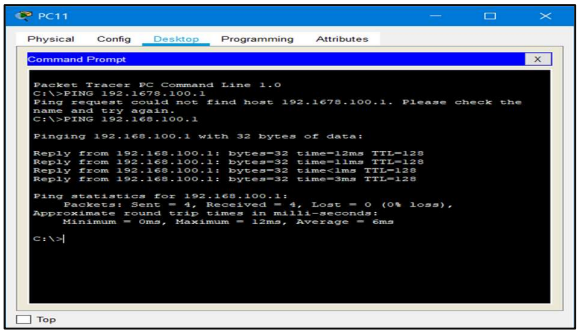

Figure 4. Server Testing

In Figure 4 is an image that describes the pinging process using the command prompt which is useful in terms of seeing whether the devices we have designed are connected to each other and it can be seen that the server test was successfully run.

IV. Conclusion

Conclusions obtained after doing research development of the LAN network at SMK Negeri 1 Belitang Madang Raya include the following:

1. The security system used in the computer network at SMA Negeri 1 Belitang Madang Raya uses a star network topology
2. Based on the test results in this development, that the Cisco packet tracer application acts to connect the local area network to make it easier to send data, speed up the connection.

V. Suggestion

From the discussion and explanation above, the author would like to give advice on the use of LAN network systems. As an alternative thought that can be used as input which means it will be very useful in the hope that it can improve optimal performance in terms of computer network systems.

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